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M E C H A N I C S.

I.—COMMUNICATING WITH A STRANDED VESSEL.

The SILVER VULCAN MEDAL was this Session given to Mr. W. THOROLD, of Melton, near Wymondham, Norfolk, for his IMPROVED REEL FOR CAPTAIN MANBY'S APPARATUS. A model of the same has been placed in the Society's Repository.

THE considerable loss every year of valuable lives by shipwreck on the British shores had early attracted the notice of the Society, and premiums were offered for the discovery of effectual means of diminishing the frequency of these distressing calamities.

In the year 1791, the sum of fifty guineas * was given to Mr. J. Bell, sergeant of the royal regiment of Artillery, for his invention, which consisted of an eight-inch shell loaded with lead, and having a light rope attached to it. The shell being discharged from a small mortar, on the deck of a stranded ship, would perform a range of about two hundred yards, carrying the rope with it, and would bury itself in the sand of the shore, so as to form a communication with the land, by means of which boats or rafts might be hauled through the surf, and thus greatly facilitate the probability of escape from the wreck.

* See Vol. X. of the Society's Transactions.

The objections to this plan consisted in the difficulty of prevailing on the owners of merchant ships to incur the expense, and on the masters to have the apparatus in constant readiness for use. Besides which, many cases would no doubt occur in which, from the pitching of the vessel, and from the sea beating over her, it would be impossible to project the shot in the right direction, or even to discharge the mortar at all.

It was therefore with much satisfaction that the Society, in 1808, conferred their large gold medal on Captain G. W. Manby, of Yarmouth, for very considerable improvements on the original proposal of Mr. Bell. These consisted in stationing the apparatus ashore instead of having it on board the ship, as indeed had previously been proposed by Mr. Bell,* thus enabling, in the first place, a single apparatus to be used in aid of every vessel that might be driven ashore on a considerable line of coast; secondly, enabling the persons intrusted with the apparatus to become familiar with it, and therefore prompt in its application; thirdly, increasing the probability of success, by having the power of placing the mortar in the most favourable position, with regard to the vessel, and of arranging the rope so as to render it much less liable to entangle, and thereby to break, than if it were thrown from the deck of the stranded vessel.

The great personal activity and exertions of Captain Manby in this very interesting and meritorious undertaking were liberally seconded by the government; and the result has been, that on the eastern part of the Norfolk coast, where Captain Manby has been stationed, 332 persons have been rescued from stranded vessels from the year 1808 to 1826, according to the subjoined list.

* See Vol. XXV. of the Society's Transactions.

I.—STRANDED VESSEL.

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Place where saved.	Date.	Names and Description of the Vessels, distinguishing those of Foreign Nations.	No. of Persons saved.	To or by whom the Case has been reported.
Yarmouth ...	12 Feb. 1808	Brig Elizabeth	5	To Committee of House of Commons, 9th May, 1823
Hasbro	5 Jan. 1809	Br. Wanderingmain, <i>Swed.</i>	13	Ditto
Yarmouth ...	15 Dec. 1809	Brig Nancy	6	Ditto
Yarmouth ...	15 Dec. 1809	Brig Camilla	7	Ditto
Pakefield ...	13 Jan. 1810	Hoy Henrietta <i>Dutch</i>	7	Ditto
Hasbro	13 Jan. 1810	Galliot <i>Dutch</i>	6	Ditto
Winterton ...	24 Jan. 1810	Vrow Maria <i>Dutch</i>	2	Ditto
Yarmouth ...	2 Oct. 1810	Brig Susan	8	Ditto
Yarmouth ...	10 Oct. 1810	Brig, collier laden	6	Ditto
Mundsley ...	2 Nov. 1810	Brig Four Friends	7	Ditto
Yarmouth ...	4 Nov. 1810	Brig Elliot	7	Ditto
Yarmouth ...	4 Nov. 1810	Brig, coal laden	6	Ditto
Lowestoft ...	10 Nov. 1810	Brig, coal laden	8	Ditto
Yarmouth ...	5 Jan. 1811	Brig, coal laden	7	Ditto
Yarmouth ...	6 Jan. 1811	Galliot <i>Danish</i>	9	Ditto
Mundsley ...	13 Oct. 1811	Brig Sophia	12	Ditto
Hasbro	20 Jan. 1812	Brig Commerce	10	Ditto
Mundsley ...	6 Jan. 1814	Brig Jongo..... <i>Dutch</i>	7	Ditto
Yarmouth ...	20 Jan. 1814	Ship Venus	9	Ditto
Hasbro	20 Jan. 1814	Galliot Verendering, <i>Dutch</i>	10	Ditto
Mundsley ...	28 Jan. 1814	Vrow Gessina..... <i>Dutch</i>	6	Ditto
Trimmingham	28 Jan. 1814	Brig Ploug <i>Danish</i>	12	Ditto
Bacton	8 Sept. 1814	Brig Hopewell	7	Ditto
Winterton ...	15 Apr. 1815	Brig Providence	7	Ditto
Winterton ...	29 Oct. 1815	Brig John	9	Ditto
Yarmouth ...	7 Nov. 1815	Brig Leipsic	10	Ditto
Mundsley ...	1 Sept. 1816	Brig Ranger	9	Ditto
Mundsley ...	12 Jan. 1818	Brig Dairy Maid	5	Ditto
Mundsley ...	26 Oct. 1819	Brig Betsy	11	Ditto
Yarmouth ...	4 Nov. 1821	Galliot Matilda.....	5	Ditto
Yarmouth ...	4 Nov. 1821	Sloop Sprightly	4	Ditto
Winterton ...	13 Oct. 1822	Sloop Dolphin	1	By Preventive Coast Guard
Winterton ...	14 Oct. 1822	Brig Supply	5	Ditto
Winterton ...	4 Mar. 1823	Brig John	10	Ditto
Winterton ...	23 Mar. 1823	Brig, laden	10	To Committee of House of Commons, 9th May, 1823
Winterton ...	31 Oct. 1823	Sloop William and Francis	2	By Preventive Coast Guard
Winterton ...	31 Oct. 1823	Brig Edmond	6	Ditto
Mundsley ...	4 Nov. 1823	Sloop Field	4	Ditto
Yarmouth ...	23 Nov. 1823	Brig Jessie	11	Ditto
Corton	1 Dec. 1823	Brig Venus	10	By Custom-Ho. Grt. Yarm.
Hasbro	2 Mar. 1824	Sloop Alexander the Great	3	By Preventive Coast Guard
Hasbro	3 Mar. 1824	Sloop Albion	2	Ditto
Filey Bay ...	12 Oct. 1824	Brig George and Elizabeth	5	Ditto
Caister	23 Nov. 1825	Ketch	7	Ditto
Yarmouth ...	20 Dec. 1825	Brig Lapwing	5	By Norfolk Association
Yarmouth ...	26 Dec. 1825	Sloop Herring	4	Ditto
Caister	19 Feb. 1826	Sloop Faith	5	Ditto
Bacton	5 Nov. 1826	Sloop John	5	By Preventive Coast Guard

Captain Manby's original method of coiling or faking the rope on the shore was an operation that required to be very dexterously performed; was impracticable in some places, from the inequalities of the ground; was liable to derangement from the wind; occupied much precious time after the arrival of the apparatus, and scarcely admitted of being performed by night. A great improvement was subsequently made by Captain Manby, in having the ropes arranged in baskets, which allows of their being now conveyed, in a state ready for immediate use, to any place where they may be wanted. Under the management of Captain Manby and his immediate assistants, the breaking of a rope in consequence of its getting foul while running out, is a very rare occurrence. Other persons less accustomed to the business, and, perhaps, less dexterous, have, however, frequently failed, and it seems to be generally allowed by the associations on the coast of Norfolk and Suffolk, for relief in cases of shipwreck, that some more certain mode of faking or coiling the rope, would be an important improvement.

In 1823, Mr. Hase, of Saxethorp, in Norfolk, being employed to cast a brass mortar for one of Captain Manby's apparatuses stationed near Cromer, constructed a skeleton reel, or rather conical spindle, as an improvement on Captain Manby's baskets. This reel was supported by an axis, which allowed of its being placed at any required angle, and the rope being wound round it, was expected to be delivered more freely and with less risk of breaking, than by the usual mode. Experiments made at Cromer confirmed the anticipation of the inventor, and the apparatus has now been in use for three years, and apparently has given much satisfaction.

Finally, Mr. Thorold has given to Mr. Hase's reel a stronger and more compact form, has both expedited and facilitated the coiling of the rope evenly upon it, and has

placed the mortar and reel upon wheels, so that it may be transported expeditiously to any place where it is wanted. The Society, however, are sensible, that by so doing, the expense of the whole apparatus is considerably increased; that it is now scarcely capable of being conveyed by hand, as Captain Manby's and even Mr. Hase's is; and that therefore situations may occur, to which it would be difficult, if not impossible, to bring it.

Observations and Description of an Improved Apparatus for saving Lives of Shipwrecked Mariners.
By W. Thorold.

Persons who make improvements in machinery are under the disagreeable necessity of exposing the previous defects, not from invidious motives, but to show wherein their improvement consists. It is therefore hoped the following observations will be ascribed to that cause, and not to any idea of detracting from the credit the inventors have so justly obtained, or to lessen them in the eyes of the Society.

At the annual exhibition of apparatus for saving lives from shipwreck, held at Cromer, on the 1st of September, 1823, the writer attended for the express purpose of improving it, if possible. The method of laying or preparing the line, appeared to him but ill-adapted for the urgency of the case, and particularly after once spent. Captain Manby has greatly improved the method described in the Transactions, by faking the line on pegs, and afterwards delivering it into baskets, ready for projection. With the Captain himself this method has seldom failed, but with others the case has been far otherwise, and generally the first three or four shots have been spent in fruitless

attempts; then recourse must be had to the old method of faking it on the beach, when the risk of failure is doubly increased, in its liability to catch the stones, or to be swept away by the sea. In order to avoid the sweep of the sea, the fakes are frequently laid higher up the beach, but in remedying one evil another is incurred, viz. the distance from the wreck is increased, a great evil in desperate cases. To show the importance of this part of the service, I shall quote Captain Manby's own words, from the 26th volume of your Transactions, page 227. "Knowing the success of the service depends upon the regularity in laying the rope, I have given a plan of the best mode repeated practice has furnished. The fakes should not exceed five or six yards, for if extended to a much greater length, the vibration at each extent (like the pendulum of a clock) becomes so considerable, that a deep-sea-line is unable to resist its force, and consequently the object of the service defeated, with the loss of the shot, and part of the line." Here is a tacit admission that faking is objectionable, although it is improved by shortening the fakes until the resistance is less than the momentum of the shot. But this success by no means proves it to be the form which offers the least possible resistance to the air and the shot; on the contrary, it proves it to be the greatest strain a line will bear without breaking, for if the fakes are lengthened a little, the shot breaks away, and by analogy we may infer, that fakes, however short, offer more resistance than the circular form, in the manner used in the whale fishery. Of this latter Captain Manby says, "Could persons in the performance of this service be always collected, the latter method would have the decided advantage over the first, being laid in much less time." See his "Essay" and "Supplement to Encyclopædia Britannica, art. Preservers," page 364. This is precisely the coil formed by the im-

proved reel, entirely by mechanical means, and uninfluenced by mental agitation.

The next method tried on the above occasion was from a reel invented by a very ingenious mechanic in Norfolk, from whom (as I am at all times ready to acknowledge) I received the first idea of my invention. The reel of Mr. Hase was a cone, formed of two circular ends, connected by eight splines, turning upon a vertical spindle fixed in cross trees, but not connected with any cart or carriage, and elevated by a temporary contrivance. This reel consumed as much time in recoiling as the pegs and basket, and was equally liable to be deranged by the sweep of the sea; and the only advantage it possesses over the basket is its capability of being coiled in the dark.

The model herewith sent is made to a scale of three inches to the foot, which, with the sheet of drawings, it is hoped will be sufficiently explanatory. Previous to setting out, the apparatus must be put into complete travelling order, one line being coiled on the reel, and another (wound on a frame) being placed in one of the boxes; a spare shot and other necessary articles will occupy the other box. On coming to the spot opposite the wreck, the mortar is to be unshipped, and placed a few yards to leeward of the reel, and elevated about thirty degrees; the reel must be elevated in like manner when standing level with the mortar; but if above, on a cliff, the reel must be depressed lower than the mortar, according to the height above it. Previous to firing, the ring with the crank attached to it is to be removed from the head of the reel, the guide is to be thrown back, and the line is to be fastened to the shot. Some person must now place his finger on the first coil, to prevent it from being blown off, and he is to retreat, just before the discharge of the mortar. After firing, if the shot has missed the wreck, and it becomes necessary to fire again, the reel

must be brought to point blank, the crank ring must be replaced, and the guide turned, with its box at the lesser end; the rope frame is to be taken from its box, and placed in a proper position; the rope is to be rove first through the nippers, then through the guide-box, and finally is to be hooked to the foot of the crank: the man may now begin to turn, when the crank ring will form the first coil; this acts upon the guide, while the second is forming, and so on till the whole rope is wound on the cone: the end is then fastened, and the cone likewise, to keep it from turning; it is now ready for projection as before. It may now become necessary to coil the first rope; to do this, nothing more is required than to bring the reel a quarter round, so as to have its broadside to seaward, then place a man with the nippers between the sea and the reel, and the line may be brought in as quick from the sea as from the frame, the nippers clearing it as it passes through them. The method of winding the rope on the frame requires attention, in order that it may pay out sufficiently fast for the reel, which requires six hundred feet per minute, when working at an average speed. The method of doing this is shown by inspecting the frame; the object is, to wind it so that it may come off without catching, or being detained by another coil; this is effected by crossing back after the frame is once filled, and beginning a fresh course directly over the first.

The greatest attention must be paid to this simple operation, but it is to be performed in calm weather at any convenient opportunity. The guide-box in the model differs from the large ones, they having a friction roller, as shown in the drawings. There is also a lamp suspended upon a Hooke's joint, fixed to the spindle. The Mundesley men use a sort of wooden glove, sometimes, instead of the guide, but they cannot coil so expeditiously. Tarred ropes can be used with the reel exclusively, which

creates a great saving, as they last three times as long as white ropes: another advantage arises in the extreme pliancy of the line fresh wound on the reel, compared to that on the pegs, which must inevitably get stiff at the turns, from the length of time it remains on them.

CERTIFICATES.

These are to certify that Mr. Thorold's reel was tried on the Beach at Mundesley, in the presence of many gentlemen, and that in every respect it was found superior to any thing of the kind which has hitherto been produced. That Mr. Fowell Buxton found by his watch, Mr. Thorold was enabled to wind the line, and prepare the shot for discharge, in one minute and a half.

J. M. JOHNSON, *Lieut. R. N.*

Colney, Norwich, February 10, 1826.

I was present at Mundesley, in August, 1824, when a rope coiled round the reel invented by Mr. William Thorold, was, by means of a shot attached to it, thrice thrown over a vessel at anchor off the Beach, and have no doubt of its very great utility. Had the comparative experiment which was afterwards made been continued, so as to have afforded an opportunity of forming an opinion, I am much disposed to believe, that the superiority of the reel, except in some particular situations, would have been manifest.

JEH. POSTLE.

Mundesley, January 20, 1826.

This is to certify, that I have witnessed comparative trials with the most improved apparatus for saving lives

from Shipwreck, and am of opinion, the reel invented by William Thorold, of Great Melton, in Norfolk, is superior to any yet produced.

FRANCIS WHEATLEY,
Deputy Vice-admiral of Norfolk.

SIR;

Melton Hall, February 27, 1826.

I am most happy in being enabled to certify, that I have witnessed experiments with the reel invented by you, and heard evidence before the Central Committee, at Norwich, of which I am a member, and am of opinion, with the rest of the Committee, that its superiority was manifest over any other invention yet offered.

I am Sir,
&c. &c. &c.

Mr. W. Thorold.

EDWARD LOMBE.

Reference to the Figures, Plate 1.

Fig. 1 is the side elevation of the cart and reel in its travelling position, with the mortar in front, and stowage for all the requisite apparatus; one line is kept ready coiled on the reel: the near wheel is taken off, and the cone represented in section, to show how it is mounted on an axis. This axis is fixed in the centre of a strong wooden cross, *a a*, which is secured or framed by four bolts to the bars *b b*; these are hinged at *c* to the cart: *d* is a bar of iron, with holes, serving as an elevator; it is screwed to the frame *b*, and one of the holes being placed on a pin fixed in the cart's side, retains the cone or reel at the required angle. Two chains *e e* are fixed, one at each side of the cart, and to the frame *b b*, which retains it, when vertical,

as shown in fig. 2, the elevator *d* then catching the pin by its last hole : *f*, a moveable ring and winch-handle (shown removed in fig. 3) : *g* a guide-bar, turning on pivots in the frame *b b*, on which is a sliding box, *h*, to be used in coiling the rope.

Fig. 2, a perspective view of the cart and reel in the position necessary for coiling on the line (part of the near wheel being broken away to show the cart). The mortar is removed from the cart ; the cone is then brought to the horizontal position, and retained there by the chains *e e* and the bar *d*. Within the winch ring *f* is a hook *i* ; a bend of the line being placed on this, the reel is to be turned once round, by means of the winch, and the rope is then passed through the eye of the guide-box *h*, and the nippers *j* (the sliding guide-box *h* is shown on a larger scale in fig. 4, and with the addition of a friction roller, *k*). The rope, as it passes through the guide-box, rests on a pin, and is kept in by a tumbler *l*. The front plate *m*, on which the pin is fixed, barely touches the reel, it being relieved by the roller *k*. The last coil of line keeps pressing against this plate *m*, and gradually slides it up the bar *h* as the coils advance, thus preventing them from riding or overlapping, however rapidly the winding may be performed ; at the same time the nippers *j* deliver the line to the reel quite clear of knots or kinks.

Figs. 5 and 6 show a top and end view of the nippers open.

Fig. 7 represents the reel elevated to the firing position, and retained so by the bar *d* ; the guide *g h* is thrown back, and the winch-ring removed. When this pressure is taken off, the elasticity of the cord causes it to rise a little, and throw off two or three of the upper coils ; the next coil is kept in its place by one of the assistants laying his finger on it, and not withdrawing it till the moment of firing. The mortar is to be placed a few yards

to leeward of the reel, with the line attached to the shot. A clamp *n* hangs from the frame *b*, by means of which the last coil of the rope is to be bound to the rim of the cone, in order to secure it for travelling, the remainder of the line being on the frame *o o*. Another line on a similar frame *o o*, fig. 2, is stowed in the tail of the cart, and *p*, on the top of the cart, is a locker in front of the axle-tree for the shot.

Fig. 8 represents one of these shots, which has a cylindrical body, and is made conical behind.

The carts and reels are drawn forty times less than the original.

II.—INSTRUMENT TO ENABLE THE BLIND TO WRITE MUSIC.

The LARGE SILVER MEDAL was this Session given to DON JAIME IVERN, for his INSTRUMENT TO ENABLE THE BLIND TO WRITE MUSIC, which has been placed in the Society's Repository.

DON JAIME IVERN, the inventor of this machine, is a gentleman of Catalonia, who has been blind from his birth. He is now about twenty-five years old, and is an excellent performer both on the piano-forte and violin. Some time ago he was induced to make a journey to Montpellier, for the purpose of being couched, and though the operation was entirely without success, yet the journey had this advantage, that it afforded him the opportunity of learning to write both common letters and musical notes. On his return, he invented the machine in question, and has used it with much satisfaction ever since.